SJSU | CENTER FOR INNOVATION IN APPLIED EDUCATION POLICY

State of Formative Assessment: Reflections on Continuing Pathways and on Roads Not Taken

Research Seminar Series
University of Sydney, Australia

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Carrie Holmberg, Ed.D.

August 8, 2024, 2pm, room 612, Education Bldg.

Touchpoints of today's roundtable talk

- ❏ The path from formative evaluation to formative assessment across Australia, New Zealand, the UK and U.S.
- ❏ The seldom told story of authentic assessment and pre NCLB reforms in the U.S.
- ❏ Traditional perspectives on studying FA practice: Examining characteristics, processes and facets
- ❏ New perspectives on the study of formative assessors: A focus on progress, growth and developmental trajectories of subjects
- ❏ Possible future directions for FA research

The shift from formative evaluation to formative assessment over decades:

Scriven (1966, 1973)

Stake (1967)

Bloom et al (1971)

Sadler (1989)

Black & Wiliam (1998)

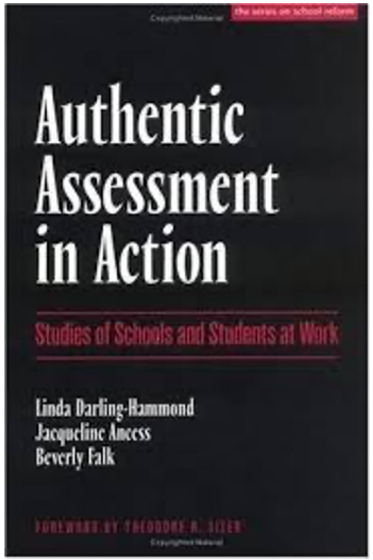
Cowie & Bell (1999, 2002)

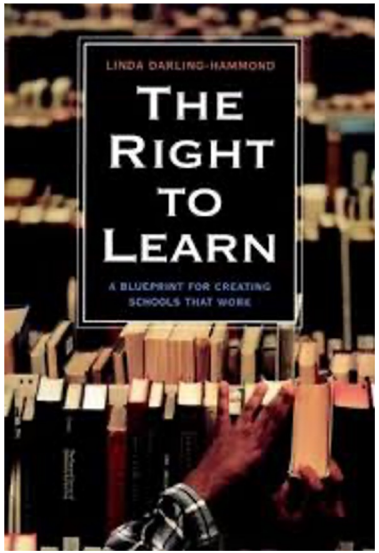
Stiggins (2002)

Shepard (2000, 2005, 2008)

Recentering role of evaluators outside schools to assessors' roles within classrooms

The alternative assessment movement and school reform in the US: Parallel literatures in 1980 and 1990s





authentic assessment

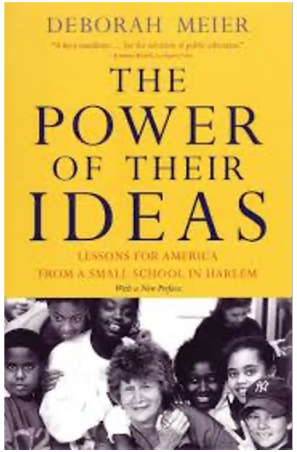
portfolio assessment

student centered assessment

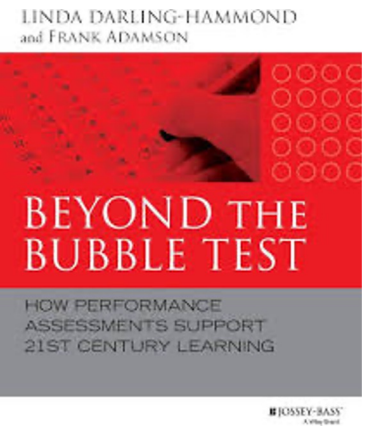
alternative assessment

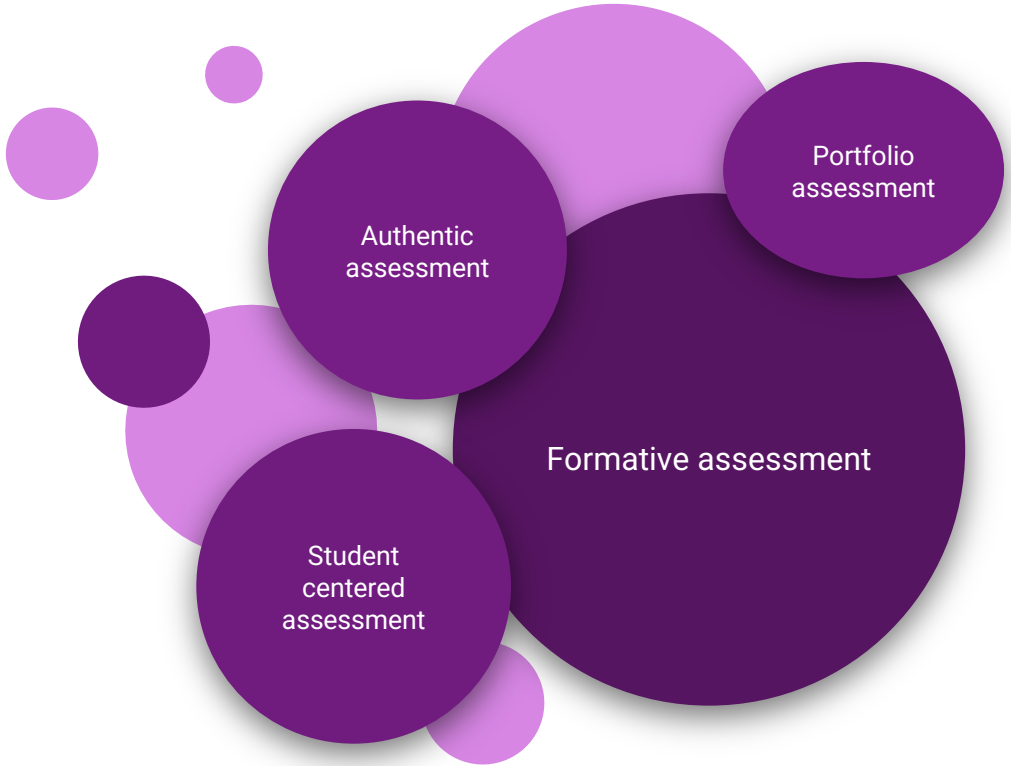
Duckor & Perlstein (2014) note

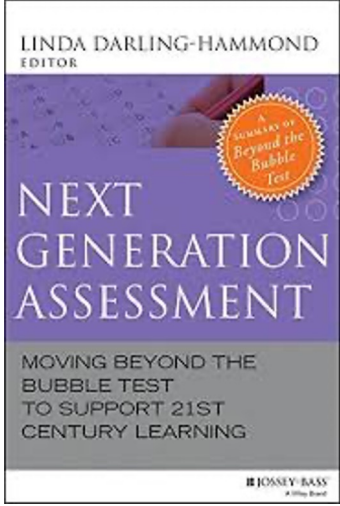
CPESS educators developed their approach to assessment to better articulate their approach to teaching and learning. **They thus had a strong sense not only of what they were assessing but also of how and why they were assessing it. "CPESS," recalls English teacher Lori C., "was based on formative assessment.** . . . What we were doing was figuring out where the kids were at, what did they need to know, how were you going to get them and bridge the gap between where you wanted to get them with the project and where they were in their learning and understanding."



CPESS students had many opportunities to revise the projects that constituted the bulk of their work before they received a final evaluation. Most feedback was geared toward improving that work and developing the skills and habits whose weaknesses it made manifest. The commitment to formative rather than summative assessment (Bloom, Hastings, & Madaus, 1971; Scriven, 1973; Shepard, 2000) was reflected in the school's version of "report cards" and how they were used.


LINDA DARLING-HAMMOND
and FRANK ADAMSON
BEYOND THE BUBBLE TEST
HOW PERFORMANCE ASSESSMENTS SUPPORT 21ST CENTURY LEARNING
JOSSEY-BASS


Authentic assessment
Portfolio assessment
Formative assessment
Student centered assessment


LINDA DARLING-HAMMOND
EDITOR
A SUMMARY OF Beyond the Bubble Test
NEXT GENERATION ASSESSMENT
MOVING BEYOND THE BUBBLE TEST TO SUPPORT 21ST CENTURY LEARNING
JOSSEY-BASS

The unsteady journey from formative assessment to understanding the work of formative assessors

Formative assessment as a thing

Static Objects

Events

Definitions, static depictions, frameworks

Formative assessors as persons

Dynamic Subjects

Actions, strategies, moves

Processes, cycles, exchanges, interventions

Representations of formative assessment (NOT the formative assessors themselves) in the extant literature

Traditionally researchers have focused on:

Definitions

Characteristics

Pictorial representations

Facets

Enacted Practices (Episodes)

Only a few have focused on:

Differences *between novices and experts* formative assessors

Mapping teacher and student assessors learning FA on a *continuum of varying levels* of sophistication

Modeling the assessors (student and teachers') *growth in FA practices* over time

Traditional perspectives on *formative assessment:* The characteristics, processes and facets approach

Characteristics	**Processes**	**Facets/Aspects**
Focus on definitions, properties, qualities	Focus on interactions, exchanges, turns of talk, etc.	Focus on part of any “configurations” “modalities” / “channels” “directionalities”
Normative	Normative and quasi-empirical	Normative and quasi-empirical

Characteristics perspective

Stiggins (2010)

- Understanding and articulating in advance of teaching the achievement targets that their students are to hit;
- Informing their students about those learning goals, in terms that students understand, from the very beginning of the teaching and learning process;
- Becoming assessment literate and thus able to transform their expectations into assessment exercises and scoring procedures that accurately reflect student achievement;
- Using classroom assessments to build students' confidence in themselves as learners and help them take responsibility for their own learning, so as to lay a foundation for lifelong learning;
- Translating classroom assessment results into frequent descriptive feedback (versus judgmental feedback) for students, providing them with specific insights as to how to improve;
- Continuously adjusting instruction based on the results of classroom assessments;
- Engaging students in regular self-assessment, with standards held constant so that students can watch themselves grow over time and thus feel in charge of their own success; and
- Actively involving students in communicating with their teacher and their families about their achievement status and improvement.

Processes perspective

Cowie & Bell (1999)

An Overview of the Model of Formative Assessment

In this section, the two forms of formative assessment are discussed together. These two forms, and the links between them, can be represented diagrammatically, as in Fig. 3.

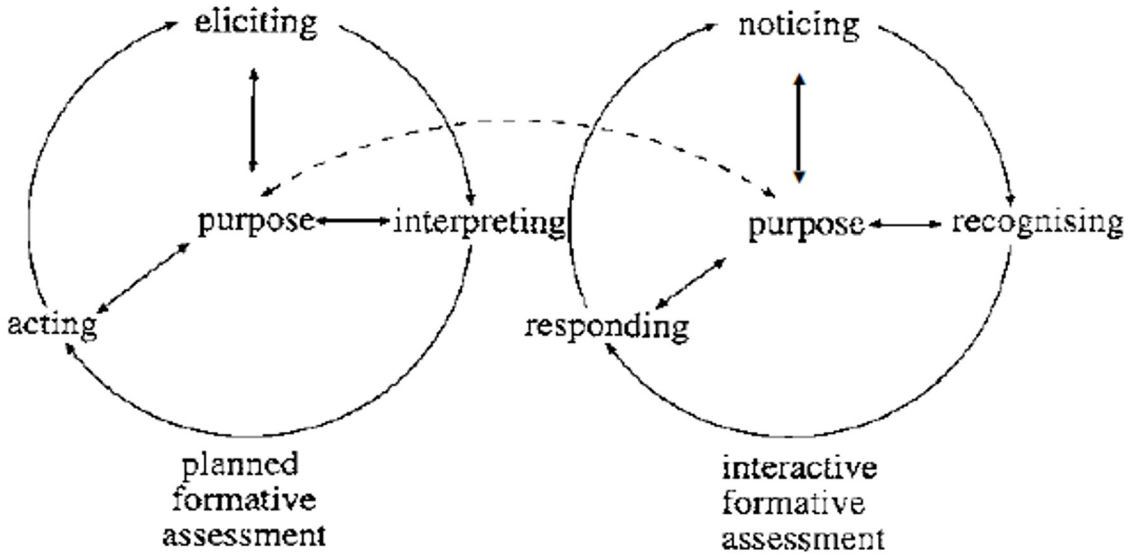
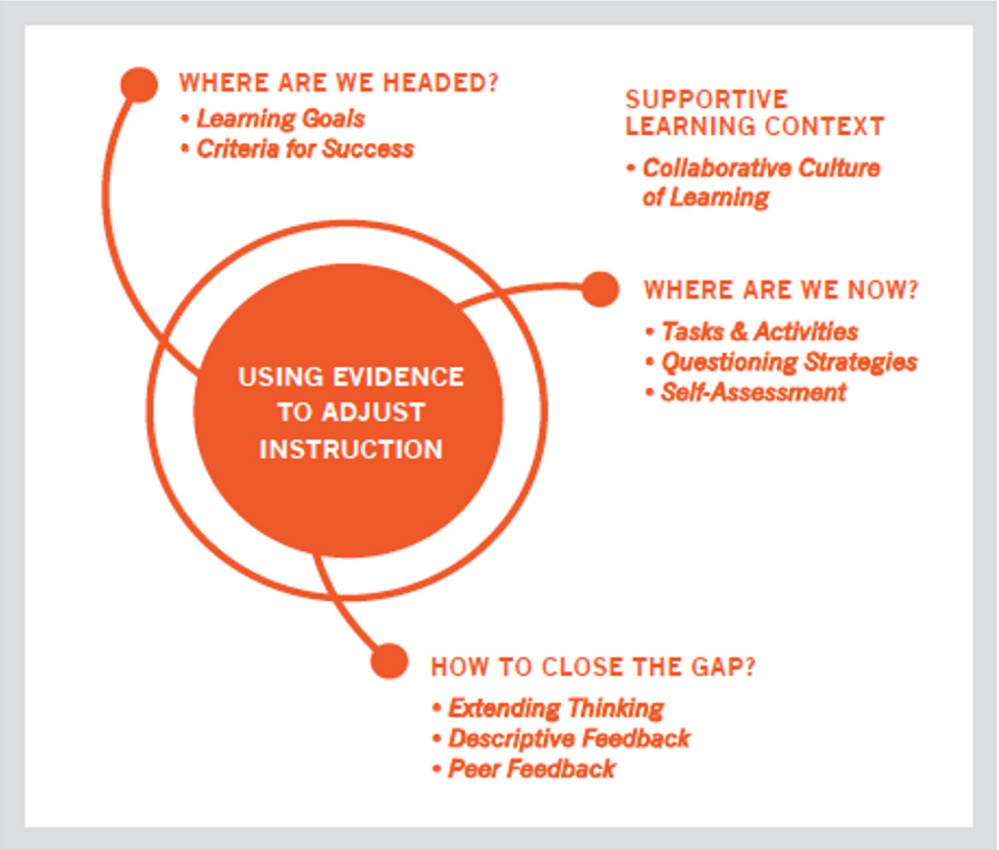


FIG. 3. A model of formative assessment.

Facets perspective

Wylie & Lyon (2017)



New perspectives on *formative assessors'* professional growth-over-time and developmental trajectories

Teachers as formative assessors means

Students as formative assessors means

Machines as formative assessors means

Developmentally sensitive continua	**Progress levels & pathways**	**Empirically calibrated observations**

Wylie et. al. (2017) use language of “dimensions” without explicit measurement focus

- *Learning goals*
- *Criteria for success*
- *Tasks and activities that elicit evidence of student learning*
- *Questioning strategies that elicit evidence of student learning*
- *Extending thinking during discourse*
- *Descriptive feedback*
- *Peer feedback*
- *Self-assessment*
- *Collaborative culture of learning*
- *Use of evidence to inform instruction*

Using **rubrics** for each “dimension”

4 Levels of observation per “dimension”

Descriptors for each Level

Towards a “FA Measures” Approach: Defining Constructs that Count

Measuring is a combination of art and science—the art gives us the momentum, and the science keeps us on track. Wright and Masters (1982, p. 3) have identified four basic requirements for measuring:

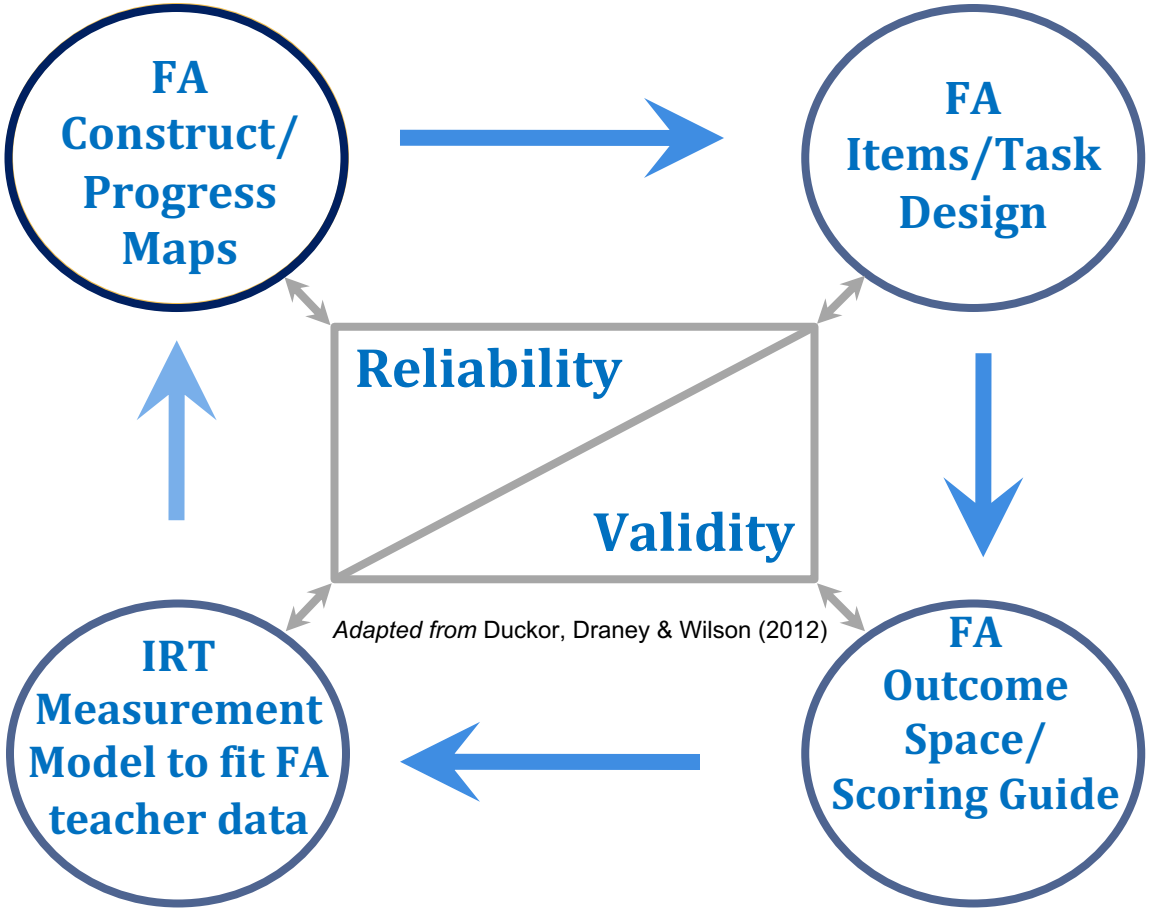
1. The reduction of experience to a *one dimensional* abstraction,
2. more or less comparisons among persons and items,
3. the idea of linear magnitude inherent in positioning objects along a line, and
4. a unit determined by a process which can be repeated without modification over the range of the variable.

These provide us useful ground rules for the science of measuring, but unfortunately, the art of measuring often hands us something that doesn’t quite conform to these fundamental rules. (Briggs & Wilson, 2003, p.88)

Defining Dimensions or “Progress Variable” in an FA Framework

Hypothesizing continua of formative assessment practices:

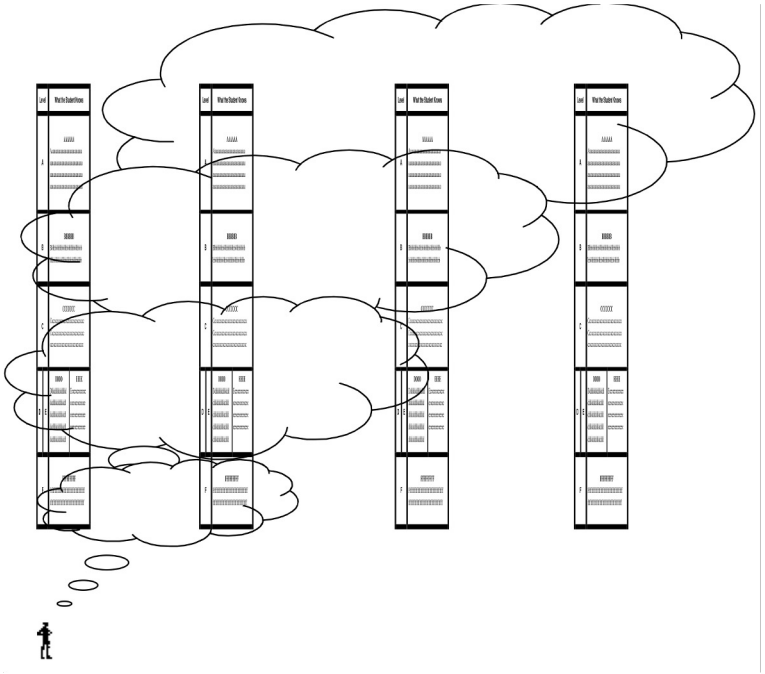
- Preparing the groundwork (**Priming**)
- Using an effective range of questions (**Posing**)
- Giving students adequate time to think and respond (**Pausing**)
- Asking follow-up questions that deepen student understanding (**Probing**)
- Sampling on a variety of responses (**Bouncing**)
- Representing variation in student thinking (**Tagging**)
- Seeing patterns and taking “Next Steps” (**Binning**)

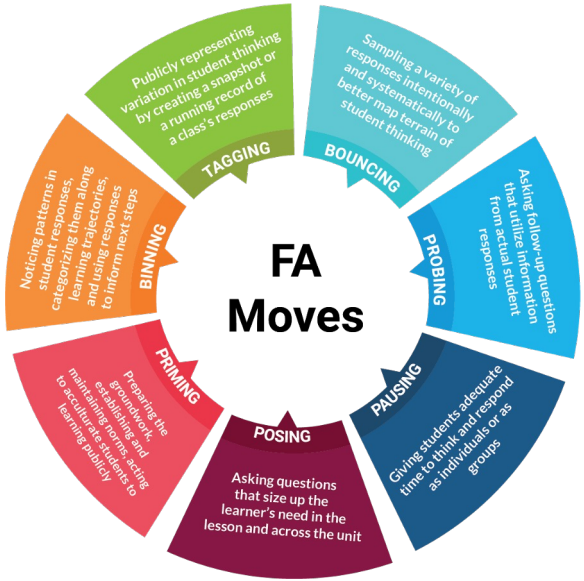


Adapted from Duckor, Draney & Wilson (2012)

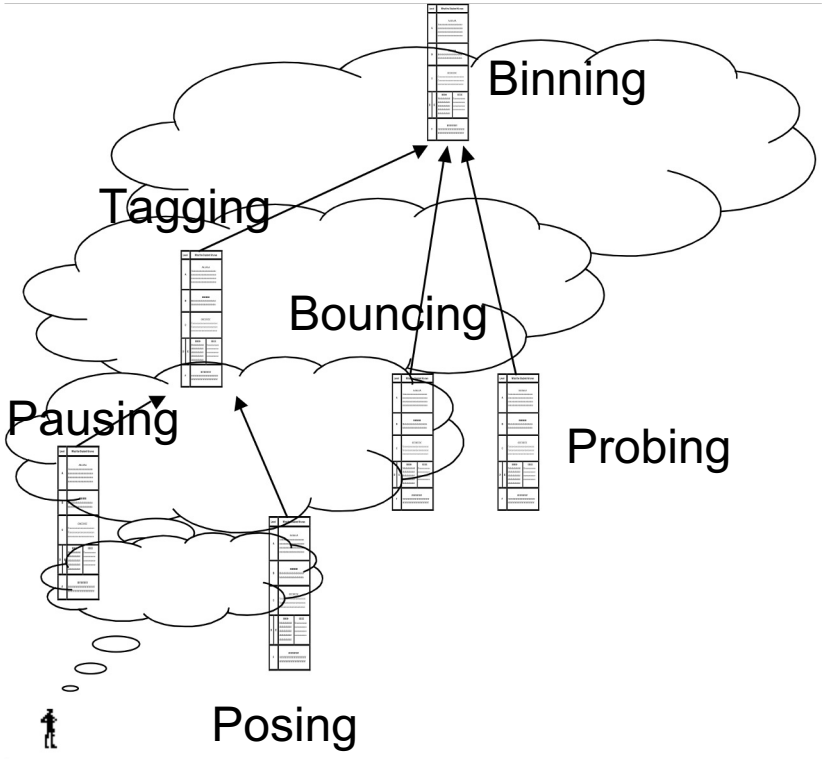
Construct Modeling and Mapping Moves

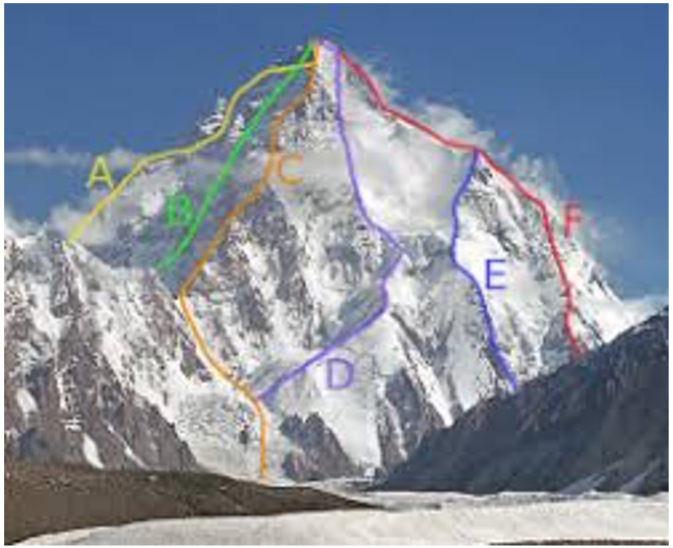
Priming Posing Pausing Probing





Hypothesizing Dimensions of FA Moves:
TLP Pathways toward becoming a formative assessor

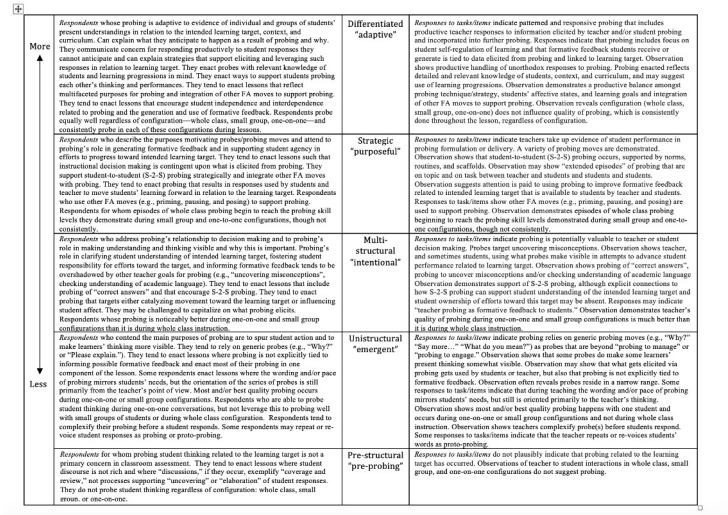




TLPs: Progress Maps

Posing-eliciting student responses
Pausing-giving students time to think/prepare responses (can be non-silent)
Probing-asking follow-up questions that invite elaboration on initial responses

Probing Construct Map



More ▲	*Respondents* whose probing is adaptive to evidence of individual and groups of students' present understandings in relation to the intended learning target, context, and curriculum. Can explain what they anticipate to happen as a result of probing and why. They communicate concern for responding productively to student responses they cannot anticipate and can explain strategies that support eliciting and leveraging such responses in relation to learning target. They enact probes with relevant knowledge of students and learning progressions in mind. They enact ways to support students probing each other's thinking and performances. They tend to enact lessons that reflect multifaceted purposes for probing and integration of other FA moves to support probing. They tend to enact lessons that encourage student independence and interdependence related to probing and the generation and use of formative feedback. Respondents probe equally well regardless of configuration—whole class, small group, one-on-one—and consistently probe in each of these configurations during lessons.	Differentiated "adaptive"	*Responses to tasks/items* indicate patterned and responsive probing that includes productive teacher responses to information elicited by teacher and/or student probing and incorporated into further probing. Responses indicate that probing includes focus on student self-regulation of learning and that formative feedback students receive or generate is tied to data elicited from probing and linked to learning target. Observation shows productive handling of unorthodox responses to probing. Probing enacted reflects detailed and relevant knowledge of students, context, and curriculum, and may suggest use of learning progressions. Observation demonstrates a productive balance amongst probing technique/strategy, students' affective status, and learning goals and integration of other FA moves to support probing. Observation reveals configuration (whole class, small group, one-on-one) does not influence quality of probing, which is consistently done throughout the lesson, regardless of configuration.
	Respondents who describe the purposes motivating probes/probing moves and attend to probing's role in generating formative feedback and in supporting student agency in efforts to progress toward intended learning target. They tend to enact lessons such that instructional decision making is contingent upon what is elicited from probing. They support student-to-student (S-2-S) probing strategically and integrate other FA moves with probing. They tend to enact probing that results in responses used by students and teacher to move students' learning forward in relation to the learning target. Respondents who use other FA moves (e.g., priming, pausing, and posing) to support probing. Respondents for whom episodes of whole class probing begin to reach the probing skill levels they demonstrate during small group and one-to-one configurations, though not consistently.	Strategic "purposeful"	*Responses to tasks/items* indicate teachers take up evidence of student performance in probing formulation or delivery. A variety of probing moves are demonstrated. Observation shows that student-to-student (S-2-S) probing occurs, supported by norms, routines, and scaffolds. Observation may show "extended episodes" of probing that are on topic and on task between teacher and students and students and students. Observation suggests attention is paid to using probing to improve formative feedback related to intended learning target that is available to students by teacher and students. Responses to task/items show other FA moves (e.g., priming, pausing, and posing) are used to support probing. Observation demonstrates episodes of whole class probing beginning to reach the probing skill levels demonstrated during small group and one-to-one configurations, though not consistently.
	Respondents who address probing's relationship to decision making and to probing's role in making understanding and thinking visible and why this is important. Probing's role in clarifying student understanding of intended learning target, fostering student responsibility for efforts toward the target, and informing formative feedback tends to be overshadowed by other teacher goals for probing (e.g., "uncovering misconceptions", checking understanding of academic language). They tend to enact lessons that include probing of "correct answers" and that encourage S-2-S probing. They tend to enact probing that targets either catalyzing movement toward the learning target or influencing student affect. They may be challenged to capitalize on what probing elicits. Respondents whose probing is noticeably better during one-on-one and small group configurations than it is during whole class instruction.	Multi-structural "intentional"	*Responses to tasks/items* indicate probing is potentially valuable to teacher or student decision making. Probes target uncovering misconceptions. Observation shows teacher, and sometimes students, using what probes make visible in attempts to advance student performance related to learning target. Observation shows probing of "correct answers", probing to uncover misconceptions and/or checking understanding of academic language Observation demonstrates support of S-2-S probing, although explicit connections to how S-2-S probing can support student understanding of the intended learning target and student ownership of efforts toward this target may be absent. Responses may indicate "teacher probing as formative feedback to students." Observation demonstrates teacher's quality of probing during one-on-one and small group configurations is much better than it is during whole class instruction.
▼ Less	*Respondents* who contend the main purposes of probing are to spur student action and to make learners' thinking more visible. They tend to rely on generic probes (e.g., "Why?" or "Please explain."). They tend to enact lessons where probing is not explicitly tied to informing possible formative feedback and enact most of their probing in one component of the lesson. Some respondents enact lessons where the wording and/or pace of probing mirrors students' needs, but the orientation of the series of probes is still primarily from the teacher's point of view. Most and/or best quality probing occurs during one-on-one or small group configurations. Respondents who are able to probe student thinking during one-on-one conversations, but not leverage this to probing well with small groups of students or during whole class configuration. Respondents tend to complexify their probing before a student responds. Some respondents may repeat or re-voice student responses as probing or proto-probing.	Unistructural "emergent"	*Responses to tasks/items* indicate probing relies on generic probing moves (e.g., "Why?" "Say more…" "What do you mean?") as probes that are beyond "probing to manage" or "probing to engage." Observation shows that some probes do make some learners' present thinking somewhat visible. Observation may show that what gets elicited via probing gets used by students or teacher, but also that probing is not explicitly tied to formative feedback. Observation often reveals probes reside in a narrow range. Some responses to task/items indicate that during teaching the wording and/or pace of probing mirrors students' needs, but still is oriented primarily to the teacher's thinking. Observation shows most and/or best quality probing happens with one student and occurs during one-on-one or small group configurations and not during whole class instruction. Observation shows teachers complexify probe(s) before students respond. Some responses to tasks/items indicate that the teacher repeats or re-voices students' words as proto-probing.
	Respondents for whom probing student thinking related to the learning target is not a primary concern in classroom assessment. They tend to enact lessons where student discourse is not rich and where "discussions," if they occur, exemplify "coverage and review," not processes supporting "uncovering" or "elaboration" of student responses. They do not probe student thinking regardless of configuration: whole class, small group, or one-on-one.	Pre-structural "pre-probing"	*Responses to tasks/items* do not plausibly indicate that probing related to the learning target has occurred. Observations of teacher to student interactions in whole class, small group, and one-on-one configurations do not suggest probing.

5 levels:

- Differentiated
- Strategic
- Multistructural
- Unistructural
- Prestructural

Based on case study research and qualitative data

Items/Task Design

- **3-5 minute video clips** of teacher w/students in whole class, small group, or one-on-one configuration
- video clips chosen by teacher candidates from Cycle 2 “informal assessment task”
- clips intended to highlight student engagement in higher-order thinking and self-assessment; teachers aimed to give feedback on the fly
- **clips were concurrently submitted to CalTPA**

CALIFORNIA
Educator Credentialing Assessments

Outcome Space Design

3 Scoring Guides aligned to CMs

Posing
1, 1+, 2-, 2, 2+, 3, 4, 5

Pausing
1, 1+, 2-, 2, 2+, 3, 4, 5

Probing*
1, 1+, 2-, 2, 2+, 3-, 3 4, 5

Scoring Guide—Posing

adaptive	5	**Poses questions that size up the context for learning and integrate: knowledge of students (including student learning needs), students' present understandings, and student progression toward the learning target and foster metacognition on efforts toward the learning target** Teacher/instruction/posing • reflects clear purposes (e.g., revealing misconception(s), promoting metacognition, fostering student agency) tied to learning target/big ideas • incorporates a range of student responses (including student questions) to promote focused disequilibrium and student responsibility for regulating learning • embodies a balance between content-centered and student-centered instruction • is tailored to individual and group needs (e.g., ELs, Ss w/504 plans) based on explicit curricular challenges • questions posed reflect knowledge of learning progressions and include hinge questions and questions that anticipate where students typically get stuck in progressing toward learning target • questions function to elicit evidence of student understanding related to learning target and increase the amount and quality of formative feedback available to students • occurs well and consistently throughout lesson regardless of configuration (one-on-one, small group, whole class)
purposeful	4	**Flexibly and strategically matches questions and questioning delivery to suit a variety of purposes tied to learning target and generation of formative feedback** • and does so in ways that improve amount and quality of "evidence" of student "understanding" available while fostering student agency in the learning process • poses a mix of questions-including higher-level (according to Webb's DOK or taxonomies such as Bloom's or Costa's), open-ended, and how and why questions • questions elicit a wide range of responses, including misconceptions and "unorthodox" responses • adjusts in response to student responses (including student questions) • incorporates other FA moves to support posing • posing during whole class configuration begins to reach level of posing demonstrated during small group and one-to-one configurations, though not consistently
intentional	3	**Exhibits limited range of purposes of, questions used for, and responses elicited from posing which may or may not generate tailored formative feedback** • poses a high percentage of lower-level (e.g., Bloom's, Webb's DOK, etc.) and closed-ended questions • still falls into "guess what the teacher is thinking" exchanges • elicits students' prior knowledge related to learning target • seldom elicits a wide range of responses • may promote student responsibility for managing efforts toward learning target • is noticeably better during one-on-one and small group configurations than it is during whole class instruction
emergent	2+	• re-poses questions to support access to academic language and concepts, not just elicit correct answer
	2	**Poses to direct student behavior or responses** • posing may be behavior/compliance-based: e.g., "Are your books open to page 39?" • questions elicit correct/incorrect responses, and not much more about student thinking • re-poses with tweaks that seem to help students, perhaps by reducing cognitive load • best quality of posing occurs during one-on-one /small group configurations and not during whole class instruction
	2-	• directive poses expect agreement with teacher
pre-posing	1+	• answers own questions, which are often lower-order, closed-ended questions • rapidly poses a series of related questions in quick succession, increasing cognitive load and perhaps raising affective filters • re-poses of questions often expect agreement with teacher • may be confounded with classroom management
	1	**No posing plausibly related to learning target occurs** • during lesson enactment regardless of configuration: whole class, small group, or one-on-one • believes all questions are of equal use and does not distinguish among uses during a lesson

Linking construct theory with scoring designs

Probing Construct Map

More ↑	*Respondents* whose probing is adaptive to evidence of individual and groups of students' present understandings in relation to the intended learning target, context, and curriculum. Can explain what they anticipate to happen as a result of probing and why. They communicate concern for responding productively to student responses they cannot anticipate and can explain strategies that support eliciting and leveraging such responses in relation to learning target. They enact probes with relevant knowledge of students and learning progressions in mind. They enact ways to support students probing each other's thinking and performances. They tend to enact lessons that reflect multifaceted purposes for probing and integration of other FA moves to support probing. They tend to enact lessons that encourage student independence and interdependence related to probing and the generation and use of formative feedback. Respondents probe equally well regardless of configuration—whole class, small group, one-on-one—and consistently probe in each of these configurations during lessons.	Differentiated "adaptive"	*Responses to tasks/items* indicate patterned and responsive probing that includes productive teacher responses to information elicited by teacher and/or student probing and incorporated into further probing. Responses indicate that probing includes focus on student self-regulation of learning and that formative feedback students receive or generate is tied to data elicited from probing and linked to learning target. Observation shows productive handling of unorthodox responses to probing. Probing enacted reflects detailed and relevant knowledge of students, context, and curriculum, and may suggest use of learning progressions. Observation demonstrates a productive balance amongst probing technique/strategy, students' affective states, and learning goals and integration of other FA moves to support probing. Observation reveals configuration (whole class, small group, one-on-one) does not influence quality of probing, which is consistently done throughout the lesson, regardless of configuration.
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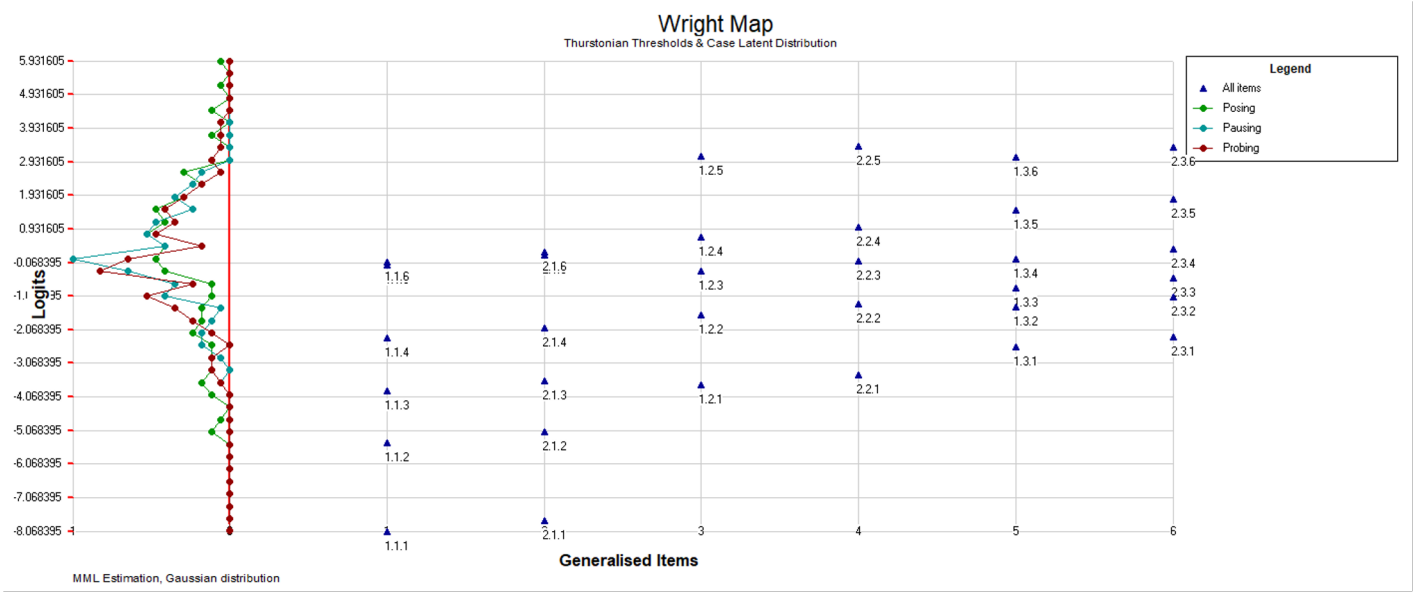
Less ↓	*Respondents* for whom probing student thinking related to the learning target is not a primary concern in classroom assessment. They tend to enact lessons where student discourse is not rich and where "discussions," if they occur, exemplify "coverage and review," not processes supporting "uncovering" or "elaboration" of student responses. They do not probe student thinking regardless of configuration: whole class, small group, or one-on-one.	Prestructural "pre-probing"	*Responses to tasks/items* do not plausibly indicate that probing related to the learning target has occurred. Observations of teacher to student interactions in whole class, small group, and one-on-one configurations do not suggest probing.

Probing Scoring Guide

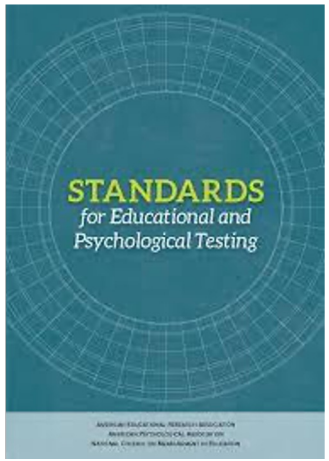
Adaptive	5	**Anticipates where and how students typically get stuck and leverages student responses (and student-to-student probing) to advance multiple students' understanding of target content** Teacher/instruction/probing • includes focus on students regulating own efforts and strategies toward learning target • uses responses to probing to improve formative feedback available to students and productively handles "surprise" responses • probing tied to learning progression • integrates other FA moves for synergistic effects • occurs well and consistently throughout lesson regardless of configuration (1-on-1, small group, whole class)
Purposeful	4	**Serves to benefit the generation of focused formative feedback and student agency in progression toward learning target and incorporates students' ideas, "presumptions" and words** • engages a range of student responses/performance "levels" to inform decision making, promote student agency, and improve formative feedback • scaffolds student-to-student (S-2-S) probing and promotes increasing student responsibility for exploring limits of "understanding" • reflects productive balance with learning goals and students' affective states • uses other FA moves, e.g., priming, re-posing and pausing, to support • episodes of whole class probing begin to reach probing skill demonstrated during small group and one-to-one configurations, though not consistently • uses probes to collaboratively construct accurate representation of student thinking/meaning
Intentional	3	**Aims to make student thinking visible, uncover misconceptions, and explore student explanations** • includes probing of "correct answers" • often demonstrates goal of extending dialogue between individual and groups of students and/or getting students to use academic language • may feature explicit support of student-to-student probing • supports student ownership of efforts toward intended target of learning, but this may not be foregrounded or done consistently • may be challenged to leverage on the fly what probing elicits inquiry stance may appear as strategic guessing of student thinking/meaning (e.g. "Do you mean…?") • is noticeably better during one-on-one and small group configurations than during whole class instruction most of the time
	3-	• explicitly makes student thinking visible, connected to learning task • uses students' own words to clarify misunderstood concepts or academic language use
Emergent	2+	• wording and pace of probing mirrors students' needs, but still is oriented primarily to teacher's thinking • may support students' academic language via recasting student responses with target academic language
	2	**Focuses on spurring student action towards teacher's perception of learning goals; makes teacher thinking more visible to students; may include giving hints or leading questions** • probes are often closed-ended • applies generic "go to" probes (e.g., "Why?", "Say more…") indiscriminately • occurs mostly in one component of the lesson and mostly to "incorrect answers" • largely "presumptive" stance appears as statements/clarifications about student thinking/meaning ("Oh, you mean…?") • quality of probing during one-on-one configuration is the best probing that occurs (compared to small group or whole class probing attempts)
	2-	• re-introduces/re-states probe(s) before student can respond or answers own probe • revoicing/recasting are probe-like and oriented towards teacher's learning goals
Pre-probing	1+	• much "probing" occurs as revoicing, repeating, clarifying, or summarizing of student responses or as rhetorical questions (e.g. "Is this what you said?", "That's pretty cool, right?") • occurs mostly or only during one-on-one configuration
	1	**No probing plausibly related to learning target occurs** • during lesson enactment regardless of configuration: whole class, small group, or one-on one • believes all questions are of equal use and does not distinguish among uses during a lesson

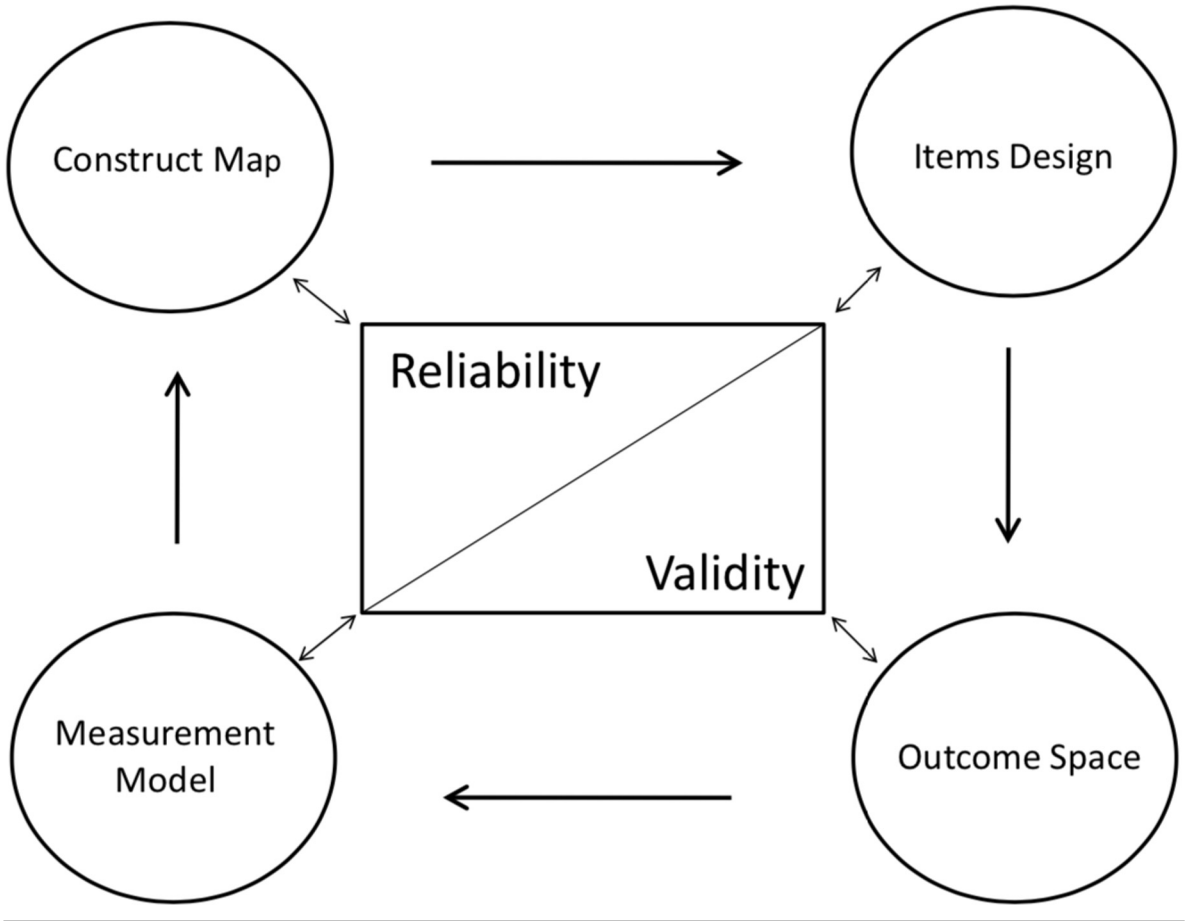
Measurement Models with Wright Maps

Rasch Model: Wright Map

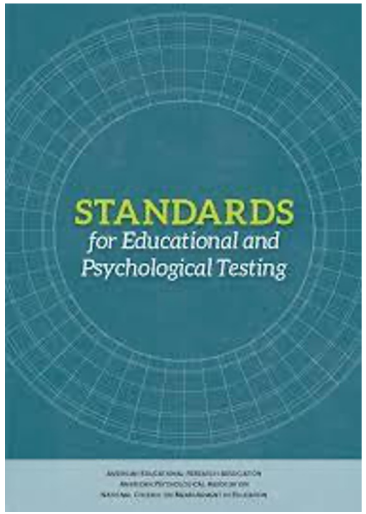


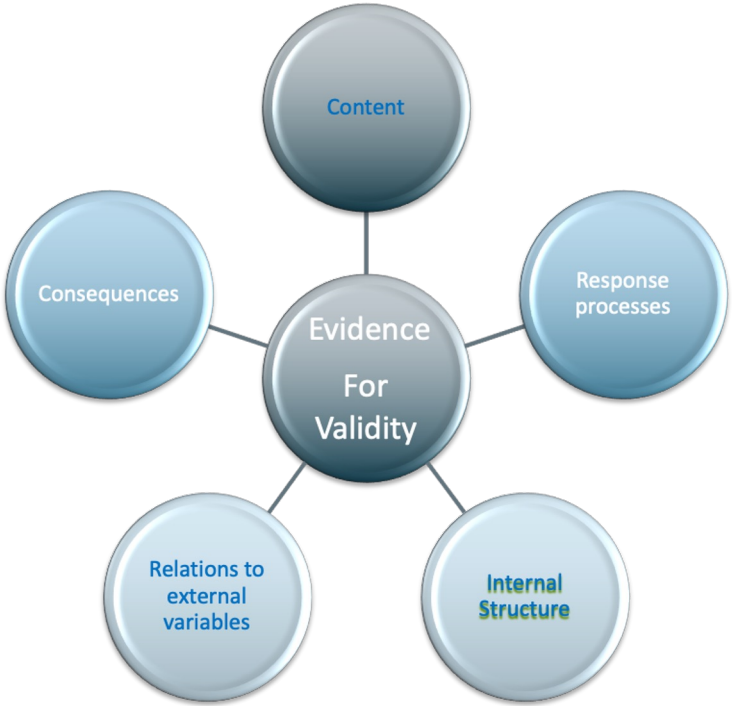
Evidence for formative and summative "FA measures" matter

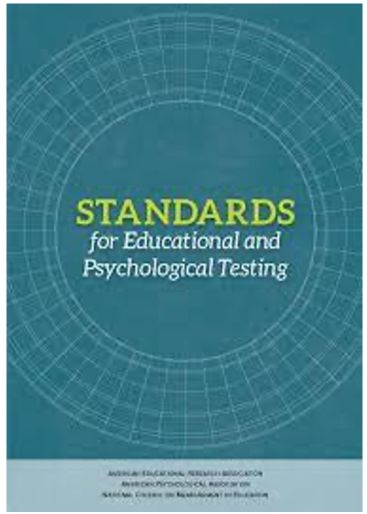




Role of 2014 Testing Standards in evidence-based claims to support uses







Linking summative and formative aims: The Promise of Progress Variables Perspectives

- Yields **classroom level "real time" insights and more generalizable data on performance** as growth over time

- Generate **user friendly information** tied to core aspects of content and curricular domains

- Provide basis for self- and peer assessment that in conjunction with teacher/instructor leads to **more formative feedback on "progress**"

Research questions for the future FA study: Grain size and problems of practice matter for making a difference

What can educational researchers and experts tell us about expected outcomes i.e., levels of progress, for teachers who are developing their expertise with questioning techniques and strategies, making sense of data from an exit ticket, putting concept maps on the dry erase board to document variation in student thinking, using a gallery walk for a peer-based feedback protocol, or differentiating feedback through self-assessment comments added to a shared document, and so forth?

Research questions for the future FA study: Progressions in practice matters for making a difference

What do we know about how, and in what ways, teachers learn and enact and reflect upon discreet FA practices, strategies, and tactics along various proposed dimensions?

Are there facets of FA practice that resist the notion of qualitative differences and progressions?

If so, which ones? Why?

Research questions for the future FA study: ZPD in becoming a formative assessor matters for making a difference

What are teachers' (and their students and now machines!) zones of proximal development with respect to complex FA practices?

To use a mountaineering metaphor, are there "fixed lines" and "bottlenecks" and "slippage" that "naturally" accompany the individual's movement toward FA expertise?

How, if at all, can one become a formative assessor in ***different subject disciplines or across them*** *as part of learning to learn in the 21st c.?*

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Thank you

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